

# NORTHROP GAMMA

## INSTRUCTION MANUAL



### **Congratulations on your acquisition of Maxford USA's Northrop Gamma!**

The Northrop Gamma was a single-engine all-metal monoplane designed in the 1930s, with many variants that shared then-innovations such as wing fillets, aerodynamic spats covering its fixed landing gear, and a fully enclosed cockpit.

Initially serving as a rugged civilian transport, the Gamma was used as a mail plane by Trans World Airlines, and later military versions served mainly as light bombers for the US, Chinese and Spanish Republican air forces.

In June 1933 a Gamma 2A "Sky Chief" was flown by Frank Hawks from Los Angeles to New York in a record 13 hours, 26 minutes, and 15 seconds. Not to be outdone, in 1935 Howard Hughes used his modified Gamma 2G to set a new record of 9 hours, 26 minutes, and 10 seconds.

The most famous Gamma was probably the "Polar Star," used by polar explorer Lincoln Ellsworth and pilot Bernt Balchen who became the first people to fly over Antarctica on January 3, 1935. In November 1935 this same Gamma was again selected as Ellsworth and Canadian pilot Herbert Hollick-Kenyon used it to attempt the world's first trans-Antarctic flight from Dundee Island in the Weddell Sea to Little America; however, after flying more than 2,400 miles and getting to within 25 miles of their goal, on December 5, 1936 the "Polar Star" ran out of fuel! Ellsworth and Hollick-Kenyon managed to survive in the abandoned Richard E. Byrd camp, and they were rescued on January 15, 1936 by the crew of the research vessel "Discovery II." The abandoned "Polar Star" was eventually recovered, and it was donated to the Smithsonian National Air and Space Museum, where it resides to this day.

Maxford USA's ARF version of the Northrop Gamma began as an idea suggested by one of our valued customers, Mr. Gerard Harrison. Design work began in mid-2009, but our first prototype flew too fast and was very difficult to control. After changes to the wing and control surfaces, our second Gamma flew every bit as well as our popular "Golden Age of Aviation" models of the Gee Bee and Hughes H-1. We now proudly offer the Northrop Gamma with the following special features:

1. Prepainted Max-Cowling fiberglass cowl – No visible screws.
2. Two-piece scale wheel pant "spats" – With the bottom section of each set attached by rare-earth magnets for easy removal for improved ground clearance when flying from grass fields.
3. Steerable, spring-loaded tail wheel.
4. Two-piece wing and filleted center section.
5. Two sets of decals for you to select between the Gamma version 2A ("Sky Chief") or 2B ("Polar Star").



***We invite you to enjoy the pride of ownership and the joy of flying your high-quality balsa and light-ply almost-ready-to-fly version of this historic aircraft.***

# TABLE OF CONTENTS

Important safety precautions .....	2	Assembly instructions .....	4
Warranty, liability waiver, and return policy .....	3	Setup and adjustments .....	6
Specifications .....	3	Preflight checks .....	6
Parts List .....	3		

## IMPORTANT SAFETY PRECAUTIONS TO PROTECT YOUR MODEL, YOURSELF & OTHERS

1. This product should not be considered a toy, but rather a sophisticated, working model that functions much like a full-scale airplane. Because of its performance capabilities, this product, if not assembled and operated correctly, could cause injury to you or spectators and damage to property. Maxford USA provides you with a high-quality, thoroughly tested model airplane kit with assembly instructions. However, the quality and capabilities of your finished model airplane depends on how you build it, and your safety depends on how you use and fly it. Any testing or flying of this model airplane is done entirely at your own risk.
2. Assemble the model airplane according to these instructions. We recommend that you do not alter or modify the model, as doing so may result in an unsafe or unworkable model. In a few cases the instructions may differ slightly from the photos; in those instances the written instructions should be considered as correct. If you have any question or concern about these instructions, before you proceed with assembly of this product, contact us at (562) 529-3988, Monday through Friday, except national holidays, between 8:30 AM to 5 PM Pacific time.
3. It is your responsibility to install the R/C system and other components in such a way that this model airplane passes all ground safety/range tests and that the power system and controls operate smoothly and correctly.
4. Recheck the operation of this model airplane before every flight to ensure that all equipment is still operating correctly and that the model has remained structurally sound. Also before every flight, check all clevises and other connectors; do not fly without replacing any that you find damaged or defective.
5. If you are not an experienced R/C pilot or have not flown this type of model before, we recommend that you get the assistance of an experienced R/C pilot.
6. Throughout the lifetime of this model, use only the Maxford USA-recommended or equivalent electric motor and a new or well-maintained R/C radio system and the Maxford USA-recommended or equivalent batteries.
7. **LITHIUM BATTERY HANDLING & USAGE WARNING!!** When using LiPo batteries, read the battery's instruction sheet or on-line information. Failure to follow all instructions could result in permanent damage to the battery, its surroundings, and bodily harm! If you crash this model airplane, check for battery damage. Do NOT use or charge a damaged Li-Po battery.

ONLY use a Li-Po approved charger.

(NEVER use a NiCd/NiMH charger!)

ALWAYS set the charger's output to match the battery's voltage and mAh ratings.

ALWAYS charge through the battery's "charge" connector. (NEVER charge its "discharge" leads.)

ALWAYS charge in a fireproof location.

NEVER place on combustible materials or leave unattended during charge or discharge.

NEVER charge a LiPo battery in excess of 4.2V per cell.

NEVER discharge a LiPo battery below 2.5V per cell.

NEVER allow battery temp. to exceed 150° F (65° C).

NEVER charge at a current greater than 1C (for example, in the case of a 2100 mAh battery, that's 2.1 amps).

NEVER trickle charge.

NEVER disassemble or modify pack wiring in any way or puncture cells.

### KEEP BATTERIES OUT OF THE REACH OF CHILDREN

8. While this kit has been flight-tested to meet or exceed our rigid performance and reliability standards in normal use, if you plan to perform any extremely high-stress flying, such as racing or advanced aerobatics, or if you plan to install a larger motor than specified, you (the buyer or user of this product) are solely responsible for taking any and all necessary steps to reinforce the high-stress points and/or substitute hardware that is more suitable for such increased stresses.
9. This model includes fiberglass and/or carbon-fiber reinforced plastic parts that may require some cutting or sanding. Fiberglass and carbon-fiber dust may cause eye, skin and respiratory tract irritation. If you ever grind, drill or sand such parts, always wear safety goggles, a particle mask and rubber gloves; never blow into such a part to remove fiberglass or carbon-fiber dust, as the dust may blow back into your face.

# WARRANTY, LIABILITY WAIVER, AND RETURN POLICY

Maxford USA guarantees this kit to be free of defects in material and workmanship at the time of purchase. All of our products have been inspected in our factory and are checked again when shipped from our warehouse.

However, Maxford USA cannot directly control the materials you may use nor your final assembly process. Therefore, Maxford USA can NOT in any way guarantee the performance of your finished model airplane. Furthermore, in purchasing this product, you (the buyer or user of this product) exempt, waive, and relieve Maxford USA from all current or future liability for any personal injury, property damage, or wrongful death, and if you (the buyer or user of this product) are involved in any claim or suit, you will not sue Maxford USA or any of its representatives.

If you do not fully accept the above liability and waiver, you may request a return merchandise authorization number (RMA#) as explained in item 2, below.

If you think there is a missing part or any shipping damage, please read our after-sales service and return policy as outlined below.

1. Inspect your order upon delivery for any shipping damage or missing part. If you find a problem, you must contact us within 10 days from receipt of your purchase by calling (562) 529-3988, Monday through Friday, except holidays, between the hours of 8:30 AM and 5 PM Pacific time. During this telephone conversation, and with your support, we will determine how to resolve your concern. (Note: Maxford USA Li-Po batteries are sold without warranty and are not eligible for return or credit.)
2. To request an RMA#, call (562) 529-3988, Monday through Friday, except holidays, between the hours of 8:30 AM to 5 PM Pacific time. If we elect to issue you an RMA#, you must clearly mark this RMA# on the outside of the package. (No return or exchange will be authorized after 10 days from the date of your receipt of the product; any package delivered to us without a Maxford USA RMA# is subject to being returned to the sender, as received, with return postage payable upon delivery.) Returned merchandise must be in its original condition as received from Maxford USA, with no assembly or modification, in the original packing materials, complete with all manuals and accessories. Return shipping and insurance charges must be prepaid by you, the buyer.
3. Returned merchandise that is accepted by Maxford USA for credit is subject to a 10% to 20% restocking fee; the final amount will be determined by Maxford USA upon receipt and examination of the returned merchandise.

Return Address:

**Maxford USA RC Model Mfg., Inc.**  
**15247 Texaco Ave.**  
**Paramount, CA 90723**

(IMPORTANT: If issued by Maxford USA, print the RMA# on the package near the above address.)

## SPECIFICATIONS\*

Wingspan .....	40 inches	Length .....	40 inches
Wing Area .....	259 square inches	Flying weight .....	1 pound, 12 oz.
Motor (Not included) .....		Brushless outrunner; 277 Watt; 1,2800 RPM/V (Recommended: Uranus 28309 or equivalent)	
Electronic speed control (Not included) .....	Brushless, rated for use with a 3S-LiPo battery at 25 Amps. (Recommended: Uranus 25A or equivalent)		
Battery (Not included) .....		Lithium Polymer, 3S/1300mAh, 20C	
Propeller (Not included) .....		10x5	
Radio transmitter/receiver (Not included) .....		Minimum of 4 channels with 4 servos (Recommended: Maxford USA SG90 mini servo or equivalent)	

\*(All dimensions and weights are approximate; production parts may vary from prototype photos.)

## PARTS LIST

1. **Items you must supply to complete this model of the Northrop Gamma:**
  - Electric motor, propeller, electronic speed control, LiPo battery and suitable LiPo battery charger.
  - 5-minute epoxy, cyanoacrylate (CA) adhesive, windshield glue (such as J & Z Products' "Z RC/56" or equivalent) and masking tape.
  - A few common hand tools such as long-nosed and diagonal or side-cutter pliers, etc..
  - Radio transmitter, receiver and servos (with a minimum of 4 channels and 4 servos).
  - Two 12-inch extensions and, depending on your radio, you may also need one(1) 6-inch Y-connector for ailerons.

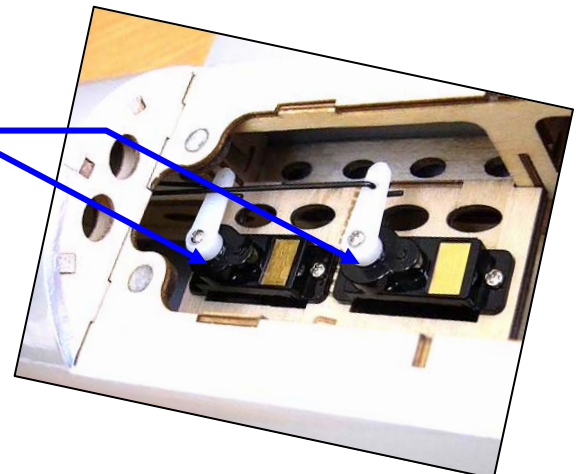
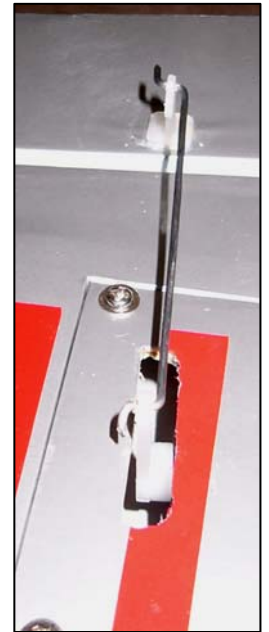
## 2. Items included with this model of the Northrop Gamma:

- Preformed landing gear and two-part wheel pants with bottom sections held on with rare-earth magnets for easy removal when flying from a grassy field.
- Steerable tail wheel with spring-suspension.
- Precovered wing panels with in-wing servo mounts, ailerons, precut hinge openings, and all necessary hinges and linkages.
- Precovered vertical and horizontal stabilizers, with rudder, elevators, precut hinge openings, hinges and linkages.
- Carbon-fiber wing rod, all required control horns and related hardware, including self-threading and machine screws and self-locking nuts (except those normally supplied with the servos and motor).
- Prepainted canopy and Max-Cowling fiberglass cowl.
- Precovered and pretrimmed fuselage with battery hatch secured by rare-earth magnets, and rudder & elevator pushrods.
- Two sets of decals for trim scheme options of Gamma version 2A ("Sky Chief") or 2B ("Polar Star").
- This illustrated instruction manual.



## ASSEMBLY INSTRUCTIONS

1. Insert the provided CA hinges into the precut aileron hinge slots in the trailing edge of both wing panels; position each aileron's precut CA hinge slot onto their corresponding CA hinges.
2. Being careful to leave enough clearance between the trailing edge of the wing and the front edge of each aileron so full UP and DOWN travel is not restricted, permanently secure all aileron hinges with thin CA.
3. Connect the rudder, elevator and aileron servos to your receiver and a receiver battery. Power ON the radio and use your transmitter to 'center' the rudder, elevator and each aileron servo. Disconnect the battery and servos and set the radio system aside.
4. Being careful to not move the aileron servos, install the aileron servos in their wing mounts, add 12-inch extensions and pull them through the root ribs, and attach the mounted servos to the wing panels.
5. Connect an aileron pushrod to each aileron servo's arm and control horn, then press and glue the control horn into its precut hole on each aileron.
6. Press each of the main landing gears' axles and wooden spacers into their openings on each wing panel and secure them in position with the provided metal plates and wood screws.
7. Gain access to the preinstalled, fuselage-mounted servo tray by gently sliding the rear of the battery hatch to either side to separate the rare-earth magnets, then lift the hatch up as you pull it back toward the tail, and set it aside.
8. Keeping the rudder and elevator servos centered, position the rudder and elevator servos so their output shafts are toward the rear of the fuselage. Attach the rudder's and elevator's pushrod Z-bends to the rudder and elevator servo's control arm, and mount each control arm to its servo.
9. Test-fit the horizontal stabilizer into its precut horizontal slot at the end of the fuselage. Remove any excess covering material at the center section of the horizontal stabilizer to ensure good wood-to-wood gluing surfaces between the horizontal stabilizer and the end of the fuselage.



10. Test-fit the vertical stabilizer, then test-fit the rudder/tailwheel's metal control rod by inserting it down into/through the hole at the base of the vertical stabilizer, and press it down through the hole in horizontal stabilizer and out the hole in the bottom of the fuselage.

11. Test-fit the spring-loaded steerable tail wheel onto the end of the rudder/tailwheel's metal control rod.

12. Having completed any necessary adjustment(s) to the horizontal stabilizer and/or the vertical stabilizer, apply petroleum jelly to the length of the rudder/tailwheel's control rod where it passes through the fuselage to ensure it can freely rotate, and use 30-minute epoxy to secure the horizontal stabilizer and the vertical stabilizer in their slots.

13. Insert the provided CA hinges into the precut rudder hinge slots in the trailing edge of the vertical stabilizer. Position the rudder's precut CA hinge slots onto their CA hinges and, being careful to leave enough clearance between the trailing edge of the vertical stabilizer and the front edge of the rudder so full LEFT and RIGHT travel is not restricted, permanently secure the rudder's hinges with thin CA, secure the rudder/tailwheel's control rod to the rudder with 5-minute epoxy, then attach the rudder's control horn. Align the tail wheel with the rudder and tighten the tail wheel's mounting screw onto the rudder/tailwheel's control rod.

14. Slide a plastic L-bend keeper onto the rudder's pushrod; center the rudder and make a sharp L-bend in the rudder's pushrod; secure the pushrod to the rudder's control horn with the L-bend keeper.

15. Insert the elevator's provided CA hinges into the precut hinge slots in the trailing edge of the horizontal stabilizer. Slide the elevator's precut CA hinge slots onto their corresponding CA hinges. Being careful to leave enough clearance between the trailing edge of the horizontal stabilizer and the front edge of the elevator so full UP and DOWN travel is not restricted, permanently secure the elevator to the horizontal stabilizer with thin CA. Use 30-minute epoxy to secure the elevator's control horn into its slot in the elevator. Slide a plastic L-bend keeper onto the elevator's pushrod; center the elevator and make a sharp L-bend in the elevator's pushrod; secure the pushrod to the elevator's control horn with the L-bend keeper.

16. Position the elevator's center section so it is centered between each half of the elevator and near (but not obstructing) the elevator's metal connecting rod, and secure it with a drop of CA adhesive.

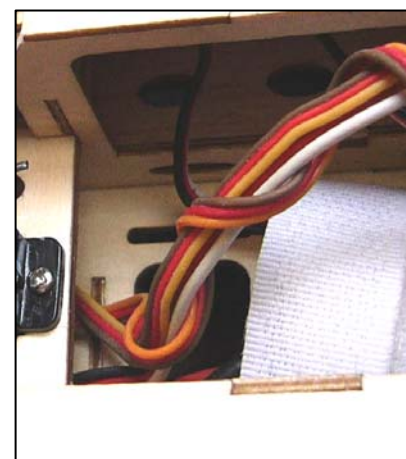
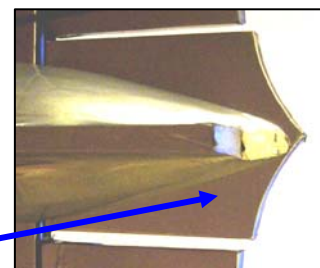
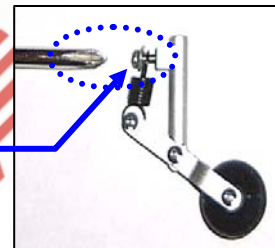
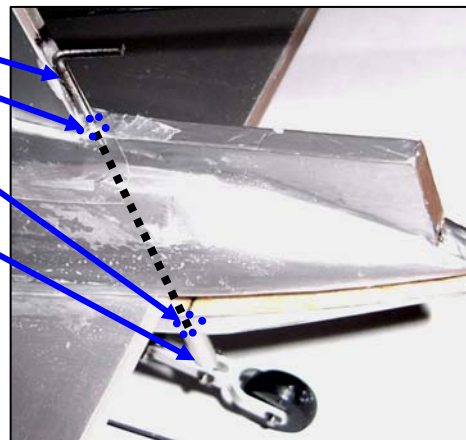
17. Starting from either side of the fuselage, insert the wing rod through the center section, centered midway through the fuselage.

18. Place the right wing panel onto the wing rod and begin to slide it toward the fuselage. When the right wing panel's root rib is within approx. 5 inches of the center section, feed the aileron extension's connector and lead into the center section and fuselage. Continue sliding the wing panel towards the fuselage and, using the bent end of a coat hanger, bring the servo extension's connector into the fuselage. Slide the wing panel fully against the center section. Repeat this process for the left wing panel. Secure the wings by applying tape along the joints where the wings meet the center section and attach both extensions' connectors to a Y-cable for connection to your Receiver's aileron channel.

19. Test-fit the rudder's pushrod from where it exits at the right side of the fuselage to where it must align with the rudder's control horn; bend the rudder's pushrod as necessary. Attach the rudder's control horn to the rudder's pushrod, insert the rudder's control horn into its opening near the base of the rudder and use 5-minute epoxy to secure the control arm to the rudder.

20. If you are building a 2A "Sky Chief," shorten the canopy to fit only the pilot. The canopy is already the correct length for the twin cockpit used on the 2B "Polar Star." Normal production tolerances and minor variations in assembly may make it necessary to slightly trim the bottom and/or rear edges where the cockpit canopy meets the fuselage. If required, trim carefully. Do not take off too much.

21. Once you are content with the canopy's fit, sparingly apply a uniform amount of windshield glue (such as J & Z Products' "Z RC/56" or equivalent) along the outer edges of the canopy's inside surfaces. Then, carefully position the canopy into its final position over the cockpit. Wipe away all excess glue and use bits of masking tape to align and hold the canopy in position while the windshield glue dries. Plan on a drying time of at least 3 hours (overnight is better).



22. Test-fit the upper portions of the aerodynamic spats. Carefully make any necessary adjustments to center the wheels within the spats, then secure each spat to the underside of the wing with three small wood screws.
23. Position the lower portions of the aerodynamic spats over the wheels; allow each to self-align and attach by the two pairs of preinstalled rare-earth magnets.
24. Using the motor's included X-mount and related hardware, attach the motor to the plywood motor box. Connect the motor's 3 wires to the electronic speed control's (ESC's) 3 wires. Connect the ESC's BEC/throttle connector to the receiver's throttle channel, and check the motor's direction of rotation as follows ...
  - a. If you are using a computer radio, ensure the transmitter's 'endpoint adjustments' are set to their normal, full-range settings. Set your transmitter's throttle and throttle trim controls to minimum. With NO PROPELLER on the motor, switch ON the transmitter and connect the ESC to the battery. Listen for a series of initialization sounds, then slowly raise the transmitter's throttle to no more than 25% of the way up; the motor should rotate in the clockwise direction as viewed from the rear of the airplane. (Run the motor slowly and only for the few seconds necessary to observe its direction of rotation.) If the motor rotated in the clockwise (correct) direction, uniquely mark each of the 3 pairs of ESC-to-motor wires to avoid repeating this test. Return the transmitter's throttle to minimum, disconnect the ESC from the battery, switch OFF the transmitter, disconnect the ESC from the motor, set aside the battery, receiver and transmitter, and proceed to step 25.
  - b. If the motor powered-up in the counterclockwise (wrong) direction as viewed from the rear of the airplane, return the throttle control to minimum, disconnect the ESC from the battery, swap either 2 of the 3 ESC-to-motor wires, and repeat the above step to ensure the motor rotates in the correct direction.
25. With the motor's direction confirmed and the wires identified, insert the ESC into the battery hatch, slide it toward the nose of the fuselage, and bring the ESC's 3 wires out through the precut openings in the firewall behind the motor. Reconnect the ESC to the motor by carefully following the markings you applied to identify the 3 pairs of ESC-to-motor wires.
26. Position the Max-Cowling fiberglass cowl over the motor and on the three preinstalled screws. Twist the cowl clockwise to lock it into position (secured by the rare-earth magnet). Install a collett and propeller onto the motor's shaft. Depending on the dimensions of your motor, its collet, and the shape of your propeller, you may need to adjust the cowl's opening and/or reposition the motor to ensure the motor and propeller freely rotate and nothing touches either the front or the inside of the cowl.
27. Position your Receiver, ESC and LiPo battery in front of the servo tray and secure with the provided hook-and-loop strap.
28. Apply decals to identify your Gamma as either a 2A "Sky Chief" or a 2B "Polar Star."

## ***Congratulations! Assembly is finished.***

### **SETUP AND ADJUSTMENTS**

1. Set the Gamma's center of gravity (CG) at 2 3/4 -inches (7cm) back from the leading edge of the wing, measured at the fuselage. If necessary, reposition the LiPo battery and/or add weight to the nose or tail to ensure the CG is correct.
2. Check the heat-shrink covering material's joints and surfaces. If necessary, carefully use a dedicated covering-material iron and heat gun to secure the edges and to tighten any loosened areas. Recheck and retighten from time to time.
3. Check/adjust servo centering, direction and endpoint adjustments. When you pull the right stick toward you, the elevator should deflect upwards; push the right stick to the right and the right aileron should deflect upwards and the left aileron should deflect downwards; push the left stick left and the rudder should deflect to the left as viewed from the rear of the fuselage.
4. If you are using a Computer Radio: For initial flights set all linkages for near-max. possible deflections; then, soften the aileron's and elevator's control throws by selecting 60% or more exponential (use 30% exponential for the rudder).  
Initial settings if you are using a Non-Computer Radio:
 

	<u>Low rates</u>		<u>High rates</u>
Ailerons .....	±10 degrees (±3/8-inch)	.....	±15 degrees (±5/8-inch)
Elevator .....	±15 degrees (±3/8-inch)	.....	±20 degrees (±1/2-inch)
Rudder .....	±20 degrees (±3/4-inch)	.....	±30 degrees (±1-inch)
5. Trim adjustments: The ailerons and rudder will probably require no adjustments (you will probably be able to leave them centered, as assembled); however, be prepared to set the elevator trim depending on how slow or fast you fly. For example, if you fly at slow, scale-looking air speeds, your Gamma's elevator will probably require a bit of up-trim. Review your radio's instruction manual if you require assistance with any radio-related questions such as servo adjustments.

## PRE-FLIGHT CHECKS

1. Double-check the security of the propeller and motor mounting box on the firewall.
2. Make certain all screws, bolts and other mechanical and electrical connections remain secure.
3. Double-check the control directions and smooth functioning of throttle, ailerons, elevator and rudder.
4. As with all radio-controlled model airplanes, this model must pass the radio-range ground check recommended by your radio's manufacturer, or you may not safely fly.
5. As a safety precaution, get into the habit of moving your transmitter's throttle control to minimum before turning ON your transmitter and before connecting your Gamma's LiPo battery.

### **REMINDER: AN IMPORTANT NOTICE TO OUR CUSTOMERS ...**

## **THIS PRODUCT IS NOT A TOY!**

Because of the Gamma's performance capabilities, this product, if not assembled and operated correctly, could cause injury to you or spectators and damage to property. Maxford USA provides you with a high-quality, thoroughly tested model airplane kit with assembly instructions. However, the quality and capabilities of your finished model airplane depends on how you build it, and your safety depends on how you use and fly it. Any testing or flying of this model airplane is done entirely at your own risk.

### **DISTRIBUTED BY:**

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**15247 Texaco Avenue**  
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